WHAT IS CLAIMED IS:

1. A fuel cell, comprising:

an ionization membrane having at least one area through which gas is passed, and which ionizes the gas passing therethrough; and

a cathode for receiving the ions generated by said ionization membrane.

2. The fuel cell of claim 1 further comprising an anode for receiving electrons generated by said ionization membrane.

3. The fuel cell of claim 1 wherein the at least one area of said ionization membrane includes an opening in the membrane with electrodes that are located closer than a mean free path of molecules within the gas.

4. The fuel cell of claim 1 wherein the ionization membrane has one of said areas.

5. The fuel cell of claim 1 wherein the ionization membrane has a plurality of said areas.

6. The fuel cell of claim 1 wherein said ionization membrane comprises: an ionizing device, comprising an insulating element having at least one opening, a first conductive electrode extending on a first surface of said insulating element at the at least one opening and a second conductive electrode extending on a second surface of the insulating element at the at least one opening, wherein said insulating element separates said first and second conductive electrodes at said at least one opening by a thickness less than the mean free path of the molecules within the gas being ionized.

7. The fuel cell of claim 6 wherein said first and second conductive electrodes are separated by less than 1 micron at the at least one opening.

8. The fuel cell of claim 7 wherein said first and second conductive electrodes are separated by less than 300 nm at the at least one opening.

9. The fuel cell of claim 8 wherein said first and second conductive electrodes are separated by less than 200 nm at the at least one opening.

10. The fuel cell of claim 9 wherein said first and second conductive electrodes are separated by approximately 50 nm at the at least one opening.

11. The fuel cell of claim 6 wherein the at least one opening tapers inwardly from the first surface of said insulating element to the second surface of said insulating element.

12. The fuel cell of claim 6 further comprising a substrate disposed between said first and second conductive electrodes for providing structural support.

13. The fuel cell of claim 6 wherein the at least one opening has a diameter approximately in the range of 2-3 microns.

14. The fuel cell of claim 6 wherein said first and second electrodes are formed of at least one of gold, chrome or titanium.

15. The fuel cell of claim 6 wherein said insulating element is formed of silicon nitride or alumina.

16. The fuel cell of claim 1 wherein ion potential is maintained positive with respect to said cathode to accelerate the ions before imprinting on said cathode.

17. The fuel cell of claim 1 wherein said cathode is a proton exchange membrane.

18. The fuel cell of claim 17 wherein ions pass through said proton exchange membrane and generate a vacuum in a direction from said ionization device to said protein exchange membrane.

19. A method of forming a fuel cell comprising:

forming a layer of thin dielectric material on a substrate that has a first specified thickness of a sufficient thickness to maintain structural integrity;

forming a first electrode on the first surface of said thin dielectric material, said first electrode being formed of a metal material;

forming at least one hole in said substrate;

forming a second electrode on a second surface of the substrate including the at least one holes, such that at least a portion of the second electrode is on a second surface of the thin dielectric material;

forming holes in the second electrode, thin dielectric material and the first electrode, which holes have side surfaces where the first and second electrodes are separated by a width of the thin dielectric material; and

providing a cathode for accelerating and neutralizing ions generated by electric fields across the first and second electrodes.

20. The method of claim 19 further comprising providing an anode for receiving generated electrons.

21. The method of claim 19 wherein said thin dielectric material has a thickness which is less than the mean free path of the gas molecules intended to be ionized.

22. The method claim 19 wherein the step of forming electrodes comprises depositing at least one of gold, chrome, or titanium.

23. The method of claim 19 wherein the step of forming a thin dielectric comprises depositing silicon nitride or alumna.

24. The method of claim 19 wherein said thin dielectric has a thickness less than 1 micron.

25. The method of claim 24 wherein said thin dielectric has a thickness less than 500 nm.

26. The method of claim 25 wherein said thin dielectric has a thickness less than 300 nm.

27. The method of claim 26 wherein said thin dielectric has a thickness of approximately 50 nm.

28. The method of claim 19 further comprising the step of applying a voltage less than 15 volts between said first and second electrodes to form a field between said first and second electrodes in the range tens to hundreds of megavolts per meter.

29. The method of claim 19 wherein said forming holes in said first and second electrode and said thin dielectric material comprises ion-beam milling.

30. The method of claim 19 wherein the at least one hole formed in said substrate forms at least one hole tapered inwardly.

31. The method of claim 19 wherein the holes formed in said first and second electrodes and said thin dielectric material are approximately 2-3 microns in diameter.

32. The method of claim 19 wherein said cathode is a proton exchange membrane.

33. A fuel cell, comprising:

ionization means for ionizing gas passing therethrough having first and second conductive electrodes having a spacing less than the mean free path of molecules within the gas being ionized; and

cathodic means for receiving the ions generated by said ionization means.

34. The fuel cell of claim 33 further comprising anodic means for receiving electrons generated by said ionization means.